WHAT IS CLAIMED IS:

1. An inorganic fluorescent material for solid-state light source, associated with a GaInN heterojunction blue solid-state light source to form white light source, the fluorescent material comprising:

oxides of rare earth metal elements, Ga and Al, wherein ions of the group consisting of Dy, Yb and Er are added in cationic cells, oxides of Al, Ga, Sc and In are added in anionic cells, the anionic cells and cationic cells combining to form a compound represented by the following general formula:

$$(Y_{1-x-y-z-q},Gd_x,Dy_y,Yb_z,Er_q,Ce_p)_\alpha(Al_{1-n-m-k},Ga_n,Sc_k,In_l)_\beta O_{12},$$

wherein α is in the range of about 2.97-3.02, β is in the range of about 4.98-5.02, x is in the range of about 0.2-0.65, y is in the range of about 0.001-0.05, z is in the range of about 0.01-0.05, q is in the range of about 0.001-0.05, p is in the range of about 0.015-0.1, k is in the range of about 0.01-0.6, n is in the range of about 0.01-0.45, and l is in the range of about 0.01-0.1, the short-wavelength light emitted from the GaInN heterojunction blue solid-state light source being mixed with a wide-bandwidth light emitted from the fluorescent material to generate a mixed light of a wavelength of about 535nm–590 nm.

2. The inorganic fluorescent material of claim 1, wherein the mixed light has a color index in the range of about 65-90, and is a uniform white light of color temperature of about 3000K – 16000K.

3. The inorganic fluorescent material of claim 1, wherein the ratio of gram-molecular weights of the oxides Y_2O_3 : Gd_2O_3 : Ce_2O_3 : Dy_2O_3 : Yb_2O_3 : Er_2O_3 in the cationic cells is in the range of about 1.9 : 0.9 : 0.15 : 0.02 : 0.01 : 0.01 to 1.65 : 1.2 : 0.055 : 0.035 : 0.035 : 0.025, and the ratio of gram-molecular weights of the oxides

Al_2O_3 : Ga_2O_3 : Sc_2O_3 : In_2O_3 in the anionic cells is in the range of about 2 : 2.8 : 0.1 : 0.1 - 1 : 2 : 1.8 : 0.2.

4. The inorganic fluorescent material of claim 1, wherein when activated oxides Ce_2O_3 + Dy_2O_3 and Yb_2O_3+Er_2O_3 are mixed at a concentration ratio of about 1:0.05–1:1, the basic spectrum appears a peak at 565nm–575 nm, which is an additional wide bandwidth, thereby the mixed light of cold white color being turned into a warm white light at a color temperature of about 12000K – 25000K.

5. The inorganic fluorescent material of claim 1, wherein linearity between the radiation intensity of the fluorescent material and the radiation power exciting the blue light is proportional to the concentration of the oxides of Er and yttrium (Y) added in the fluorescent material, and varying the value of α in the range of about 0.75–0.99 increases the radiation power of the blue light emitting device by ten times within about 10 mW/mm^2–$100mV/mm^2$.

6. The inorganic fluorescent material of claim 1, wherein when the concentration ratio of Ce_2O_3 to Dy_2O_3 is varied from 100:1 to 100:10, the varying amount of the concentration ratio of Ce_2O_3 to Dy_2O_3 determines the shift of the warm white light from the cold white light, and the intensity of the secondary peak in the spectrum at about 570nm–580 nm is proportional to the concentration of Dy_2O_3 added into the fluorescent material.

7. The inorganic fluorescent material of claim 1, wherein when the concentration ratio of activated Ce_2O_3 to Er_2O_3 is about 100:1 to 100:10 and the optimal concentration of Ce to be added in the fluorescent material is 0.01-0.03 parts by atoms, the fluorescent material emits green light.

8. The inorganic fluorescent material of claim 1, wherein re-illumination occurs with the association of a Stokes shift of 100nm or greater than 100nm at 295 K to 420K, and the external quantum efficiency γ for illumination is 0.75–0.90.

9. The inorganic fluorescent material of claim 1, wherein the fluorescent material has a prohibited bandwidth at a wavelength of about 440nm to 470nm, and the accumulated reflection index of the powder layer is about 30% to 10%, being proportional to the total concentration of oxides of Ce, Dy, Er and yttrium (Y) added in the fluorescent material.

10. The inorganic fluorescent material of claim 1, wherein the ratio of the mean value and the intermediate value of diameters of the particles is smaller than 1.5, the ratio of the length of the lengthwise axis of the particles to the wavelength of the peak is 0.5:1 to 3:1.

11. The inorganic fluorescent material of claim 1, wherein the fluorescent material powders are mixed in a silicon polymer or an epoxy mixture to form the phosphor composition, and when the mass ratio of the fluorescent material powders to the silicon polymer or epoxy mixture is 5–40%, the phosphor composition obtained includes particles of 1×10^5 to 1×10^7 per cubic meter.

12. A process of compounding the fluorescent material represented by the following general formula $Y_{1-x-y-z-q},Gd_x,Dy_y,Yb_z,Er_q,Ce_p)_\alpha(Al_{1-n-m-k},Ga_n,Sc_k,In_l)_\beta O_{12}$, wherein α is in the range of about 2.97-3.02, β is in the range of about 4.98-5.02, x is in the range of about 0.2-0.65, y is in the range of about 0.001-0.05, z is in the range of about 0.01-0.05, q is in the range of about 0.001-0.05, p is in the range of about 0.015-0.1, k is in the range of about 0.01-0.6, n is in the range of about 0.01-0.45, and l is in the range of about 0.01-0.1, the process comprising:

(a) preheating oxides of Gd, Y, Ce, Dy, Er, Yb, Al and Ga and nitrate hydride to about 80-90℃;

(b) reacting the compounds of (a) with high-concentration NH_4 to form an intermediate product consisting of hydroxides;

(c) rinsing the intermediate product to remove NO_3^{-1} ions;

(d) performing a heat treatment in a weak reduction gas environment in three stages, wherein the first heat treatment stage is performed for 1-3 hours at 500K, the second is performed for 1-3 hours at 900-110K and the third is performed for 3 hours at 1400-1700K; and

(e) cooling to 400K and graining the product obtained in (d).

13. A light emitting device, comprising:

a base;

one or more light emitting devices, mounted on the base to emit a solid-state source light of blue color of a wavelength of about 430nm to 470nm;

a lens, wherein the lens and the light emitting device define a chamber; and

a fluorescent material, filled in the chamber, wherein the fluorescent material consists of inorganic phosphor powders associated with a binder;

wherein the distance between walls of the chamber and a p-n junction emitting surface of the light emitting device is equal to that between the walls of the chamber and a periphery of the light emitting device, and a plane of the chamber supporting a geometric symmetric axis thereof is perpendicular to the p-n junction emitting surface of the light emitting device.

14. The light emitting device of claim 13, wherein the fluorescent material has a mass thickness in the range of about 1–50 mg/cm^2.

15. The light emitting device of claim 13, wherein the lights emitted from the fluorescent material are respectively of a dominant wavelength and a secondary wavelength, the dominant wavelength being about 1.2 to 1.4 times the light emitted from light emitting device, and the secondary wavelength being about 1.5–1.8 times the light emitted from the light emitting device.

16. The light emitting device of claim 13, wherein the ratio of the mean particle diameter of the inorganic phosphor material powders contained in the fluorescent material to the main wavelength of the light emitted from the light emitting device is in the range of about 1:1–10:1.